

Docket No.: 202603US2DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

Tetsuya SADA et al. : EXAMINER:

SERIAL NO: New Divisional Application

FILED: Herewith :

FOR: COOLING DEVICE AND COOLING : GROUP ART UNIT:
METHOD

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please amend this application as shown in the attachment:

IN THE SPECIFICATION

Page 2, lines 8-12, replace with the following paragraph:

In addition, in the photolithography step described above, the cooling step must be performed for one substrate several times. For this reason, in order to increase a throughput, one important problem is to shorten a time for the cooling process.

Page 20, line 16 through page 21, line 22, replace with the following paragraph:

The processing steps shown in FIG. 10 will be described below. In the processing steps, as in the processing steps shown in FIG. 9, before the glass substrate G is placed on the placing table 2, in step S30, a coolant having a predetermined temperature, e.g., 23°C is supplied from the second coolant supply means 31 into the coolant path 28 of the placing

table 21 in advance to set the temperature of the placing table 21 at a predetermined temperature. In step S31, the glass substrate G is loaded onto the placing table 21 by the main arm serving as a convey means and delivered to the support pins 21. Thereafter, the support pins 23 are moved downward to place the glass substrate G on the placing table 21. In step S31 or before or after step S31, the second electromagnetic valves 34 and 35 are closed and the first electromagnetic valves 32 and 33 are opened in step S32 to supply a coolant having a temperature lower than a predetermined temperature, e.g., 18°C from the first coolant supply means 30 into the coolant path 28. In step S32, as a timing at which the supply of the coolant is switched, for example, the coolant supply may be switched the moment a proper sensor (not shown) detects that the glass substrate G is loaded onto the placing table 21, otherwise, the coolant supply may be switched a predetermined time after the sensor detects that the glass substrate G is loaded onto the placing table 21. In addition, for example, the coolant supply may be switched the moment a command for loading the glass substrate G into the cooling device 14 is output to the main arm 9, otherwise, the coolant supply may be switched a predetermined time after the command for loading the glass substrate G into the cooling device 14 is output.

IN THE CLAIMS

Please cancel Claims 1-14. Please add new claims 15-17 as follows:

15. (New) A cooling method for cooling a substrate loaded on a placing table by supplying a coolant having a temperature lower than a target temperature into a coolant path arranged in said placing table, comprising the steps of:

(A3) setting in advance the temperature of the placing table at a temperature almost equal to said target temperature;

(B3) supplying said coolant into the coolant path to cool the substrate when the substrate temperature is changed by the loading of the substrate on the placing table or a predetermined time after the change in the substrate temperature; and

(C3) unloading the substrate from the placing table after the substrate temperature is rendered lower than the target temperature to warm the substrate to the target temperature within an atmosphere having a temperature almost equal to the target temperature.

16. (New) A cooling method for cooling a substrate loaded on a placing table by supplying a coolant having a temperature lower than a target temperature into a coolant path arranged in said placing table, comprising the steps of:

(A4) setting the temperature of said placing table at a temperature almost equal to the target temperature before the substrate is loaded on the placing table;

(B4) supplying said coolant into the coolant path to cool the substrate when or a predetermined time after the substrate is loaded on the placing table; and

(C4) unloading the substrate from the placing table after the placing table is cooled to a temperature lower than the target temperature to warm the substrate to the target temperature within an atmosphere having a temperature almost equal to the target temperature.

17. (New) A cooling method for cooling a substrate to a target temperature by allowing said substrate to be received by delivery means in an upper portion of a placing table, moving downward said delivery means to load the received substrate onto said placing table, and supplying a coolant having a temperature lower than a target temperature into a coolant path arranged in the placing table, comprising the steps of:

(A5) setting the temperature of the placing table at a temperature almost equal to the target temperature before the delivery means is moved downward;

(B5) supplying the coolant into the coolant path when or a predetermined time after the delivery means is moved downward; and

(C5) unloading the substrate from the placing table after the temperature of the placing table is rendered lower than the target temperature to warm the substrate to the target temperature within an atmosphere having a temperature almost equal to the target temperature.--

REMARKS

Favorable consideration of this application, as presently amended and in view of the following comments, is respectfully requested.

The present application is a division of U.S. application Serial No. 09/358,459. The present amendment cancels claims 1-14 and adds new claims 15-17, which are carried forward from Serial No. 09/358,459.

In view of the present amendment, it is believed that this application is now in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

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